Among the precautions that must always be considered by travelers is the general consideration that the temperature of the air can not possibly be determined satisfactorily except by using either the aspirated psychrometer of Assmann or the portable sling psychrometer; the latter was, we believe, first used by de Saussure and Espy, and is now frequently recommended by the Weather Bureau when the whirled psychrometer in a permanent thermometer shelter is not available. In fact, by using the sling psychrometer, first in the shade, and, then, immediately afterwards in the sunshine, we always have a good check on the accuracy of our work.

It is greatly to be hoped that the wealthy owners of steam yachts and sailing yachts will sometimes consider within themselves whether they can not provide accommodations for a meteorological observer and thus make it possible for us to investigate the motions of the winds and clouds, and other important phenomena on the ocean, where good observations are so rare and so greatly needed.—*C. A.*

BACK NUMBERS OF THE MONTHLY WEATHER REVIEW.

Owing to the increased demand for special numbers of the MONTHLY WEATHER REVIEW the Editor would again call attention to the fact that those who do not need to retain their copies will confer a favor by sending word to that effect, whereupon penalty envelopes will be furnished to facilitate their return.

THE WEATHER OF THE MONTH.

By W. B. STOCKMAN, Forecast Official, in charge of Division of Records and Meteorological Data.

CHARACTERISTICS OF THE WEATHER FOR MAY.

On the coast of central and northern California, and over the United States east of the ninety-fifth meridian, except in the extreme western parts of Louisiana and Arkansas and the extreme eastern part of Texas, the pressure was above the normal; elsewhere in the United States it was below the normal, and from northeastern Florida northwestward over eastern Minnesota, and northeastward over Maryland it had increased over that of the preceding month.

From central and western Nebraska southward over north-central and western Texas and New Mexico, in the lower Ohio Valley, northeastern Iowa, northwestern North Dakota and southwestern Wisconsin the precipitation ranged from 2 inches to 7 inches above the normal, while in the districts showing a deficiency in precipitation the departures were not nearly so great.

From northeastern Ohio eastward and northeastward to the Atlantic coast, west of the one hundred and fifteenth meridian, except in western Washington and on the northwestern coast of California, and in western Arizona the temperature was below the normal; elsewhere it was above the normal, and generally markedly so; and, as a rule, the isotherm of maximum temperatures of 90° or higher trends considerably to the north of where it lay in May, 1901.

The occurrence of winds of 50 miles or more per hour was considerably above the average, and was three times greater than that of May, 1901.

The number of thunderstorms during the month was remarkable, being greater than any May since the date of beginning of record in 1894.

PRESSURE.

The distribution of monthly mean pressure is shown graphically on Chart IV and the numerical values are given in Tables I and VI.

The area of relatively high pressure, which was 30 inches or slightly higher, extended from the Great Lakes southward to the Gulf of Mexico and southern Florida and southeastward over the Atlantic coast. Another, but smaller, area overlay the immediate coast of Oregon and northern and central California. Over the greater portion of the first area the departures from the mean amounted to between +0.05 inch and +0.08 inch, while over the second area they were somewhat less.

From eastern Minnesota southeastward and eastward over northeastern Florida, the Atlantic coast States and New England the pressure increased considerably over April, 1902. In the lower Lake region and the northeastern part of the upper Lake region the changes ranged from +0.10 inch to +0.13 inch. Over the other districts of the United States the pressure was lower than during the preceding month, and the greatest changes, —0.10 inch to —0.16 inch, occurred in the upper Missouri Valley and the northern Slope regions.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Over almost the entire United States the mean temperature for the month was above the normal, the only districts where it was below the normal being west of the one hundred and fifteenth meridian and in western Arizona, northeastern Ohio, northern Pennsylvania, New York, and New England. From the northern part of the west Gulf States and the western parts of the Carolinas and West Virginia northwestward over Kansas, Nebraska, and South Dakota the departures ranged from + 4° to + 8°. In the interior of central and northern California and in central Oregon the departures amounted to from — 2° to — 4°.

The average temperature for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	8	53.1	—0.4	+ 8.4	+1.7
Middle Atlantic	12	62.0	+0.4	— 0.8	—0.2
South Atlantic	10	72.9	+2.6	— 8.7	—1.7
Florida Peninsula	8	78.2	+2.3	— 6.0	—1.2
East Gulf	9	76.6	+4.0	— 6.6	—1.3
West Gulf	7	76.0	+3.4	+ 0.8	+0.2
Ohio Valley and Tennessee	11	69.1	+3.9	— 5.6	—1.1
Lower Lake	8	56.6	—0.2	+ 3.3	+0.7
Upper Lake	10	53.0	+1.6	+15.7	+3.1
North Dakota	8	56.8	+3.5	+22.1	+4.4
Upper Mississippi Valley	11	65.8	+4.4	+ 7.6	+1.5
Missouri Valley	11	65.4	+5.3	+12.3	+2.5
Northern Slope	7	56.6	+3.1	+14.9	+3.0
Middle Slope	6	66.1	+4.1	+ 8.6	+1.7
Southern Slope	6	70.7	+1.7	+ 5.7	+1.1
Southern Plateau	13	63.0	—1.5	+ 0.6	+0.1
Middle Plateau	9	55.2	—0.8	+ 4.9	+1.0
Northern Plateau	12	54.2	—0.7	+ 6.8	+1.4
North Pacific	7	54.1	—0.3	+ 2.5	+0.5
Middle Pacific	5	56.9	—1.5	— 2.6	—0.5
South Pacific	4	60.8	—1.5	— 2.2	—0.4

Except on the immediate coasts of northern California, Oregon, and Washington, and in a few scattered localities in other sections of the United States, maximum temperatures of 80° or

higher everywhere occurred. The isotherm of 90° extended generally as far north as the fortieth parallel, except in portions of the Appalachian and southern and middle Slope regions. Maximum temperatures of 90° or higher also occurred in the central part of northern California, central Oregon, south-central Washington, and generally in southwestern Idaho. Maximum temperatures of 100° or higher were reported from south-central Texas, western Arizona, and southeastern California.

Minimum temperatures of 32° or lower occurred in New England, New York, except the extreme southeastern part, northern and south-central Pennsylvania, Michigan, except the southeastern part, the northern parts of Wisconsin and Minnesota, and generally throughout the Rocky Mountain regions.

In Canada.—Prof. R. F. Stupart says:

The temperature was from average to 1° above in the western and central portions of the Lake region, from 1° to 2° above in Assiniboia and Saskatchewan, 4° above in Manitoba, and elsewhere over the large remaining portion of the Dominion it was from average to 2° below.

PRECIPITATION.

In northern New England, the lower Ohio Valley, western Tennessee, southern and western parts of the upper Lake region, upper Mississippi Valley, North Dakota, northern part of the northern slope, from Nebraska and southeastern Wyoming southward, on the west coast of southern Florida, and in scattered parts of the middle and north Pacific regions the precipitation was above the normal, the excess amounting to between 6 and 7 inches over south-central Kansas, Oklahoma, and the panhandle of Texas and from 4 to 6 inches in south-central Nebraska, parts of central Kansas, southwestern Wisconsin, and northeastern Iowa; elsewhere in the region of excess of precipitation the departures were not so large.

In Massachusetts, southeastern New York, eastern Pennsylvania, northeastern Maryland, the eastern part of the Carolinas, northeastern and extreme southern Florida, the central parts of Illinois and Ohio, southern Mississippi, southeastern Louisiana, northeastern Texas, northwestern Arkansas, southeastern South Dakota, and northwestern Iowa the deficiency ranged from 2 inches to somewhat over 4 inches. In the remaining districts the excess or deficiency amounted to less than two inches.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	8	1.86	52	−1.7	−0.8
Middle Atlantic	12	2.07	56	−1.6	−2.5
South Atlantic	10	2.38	60	−1.6	−5.6
Florida Peninsula	8	2.72	75	−0.9	−1.6
East Gulf	9	2.64	65	−1.4	−2.8
West Gulf	7	3.01	68	−1.4	−6.1
Ohio Valley and Tennessee	11	3.44	92	−0.3	−6.0
Lower Lake	8	3.21	94	−0.2	−3.5
Upper Lake	10	3.77	115	+0.5	−2.2
North Dakota	8	3.69	161	+1.4	+1.9
Upper Mississippi Valley	11	4.53	107	+0.3	−1.9
Missouri Valley	11	2.89	72	−1.1	−3.3
Northern Slope	7	3.70	161	+1.4	+0.6
Middle Slope	6	6.42	177	+2.8	+1.2
Southern Slope	6	8.88	218	+4.8	+4.0
Southern Plateau	13	0.69	117	+0.1	−1.1
Middle Plateau	8	0.35	37	−0.6	−0.7
Northern Plateau	12	2.53	131	+0.6	−0.2
North Pacific	7	2.72	93	−0.2	+3.3
Middle Pacific	5	1.32	87	−0.2	+1.9
South Pacific	4	0.03	7	−0.4	−0.5

In Canada.—Professor Stupart says:

Precipitation was everywhere above the average, except over the greater portion of the Peninsula of Ontario and the eastern portion of the Province of Ontario, as well as in the southern and eastern parts of the Maritime Provinces. The excess was very considerable from British Columbia to Manitoba and also in Quebec. Many parts of the Northwest Territories suffered greatly from freshets and the total precipitation of the month recorded at Calgary and Edmonton, namely 8.9 inches and 7.7 inches, being 7.1 and 6.1 inches above the average, respectively, is a most phenomenal occurrence in a province which has such a small mean annual precipitation. In Assiniboia and Saskatchewan the precipitation was also very excessive, while in Manitoba it was from 1 to nearly 2 inches above the average, and in Quebec from nearly 1 inch to 2½ inches above. In Ontario the distribution of the rainfall was rather varied; over the Georgian Bay district and northern localities it was above the average locally to a considerable amount; over the extreme southwestern portion it was also above, whereas many interior and eastern localities showed a deficiency of from 1 to nearly 2 inches. The deficiencies in the Maritime Provinces varied from a half to over an inch.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 4, 21, 31. Arizona, 18, 19. Arkansas, 19, 22. California, 1, 2, 4, 13, 14, 18, 25, 31. Colorado, 3, 4, 5, 8, 10, 11, 12, 13, 14, 15, 18, 19, 20, 22, 24, 25, 26, 27, 28, 29, 30. Delaware, 26. Florida, 2, 3, 30. Georgia, 1, 5, 9, 12. Idaho, 1, 2, 3, 4, 14, 17, 18, 31. Illinois, 1, 2, 3, 4, 5, 6, 17, 18, 20, 21, 22, 23, 24. Indiana, 4, 10, 13, 14, 20, 22, 23, 24, 25, 26. Indian Territory, 4, 18. Iowa, 1, 2, 3, 4, 9, 10, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29. Kansas, 1, 2, 4, 13, 19, 20, 21, 24, 25, 31. Kentucky, 2, 10, 13, 20, 23, 24, 25. Louisiana, 15, 19, 31. Maine, 2, 4, 8, 23, 28. Maryland, 3, 7, 20, 25. Massachusetts, 25. Michigan, 3, 5, 6, 8, 19, 22, 26. Minnesota, 1, 3, 6, 9, 17, 19, 20, 21, 23, 24. Mississippi, 16. Missouri, 1, 2, 4, 13, 14, 19, 21, 23, 24, 25. Montana, 1, 16, 24, 26, 27, 29, 31. Nebraska, 1, 2, 10, 13, 17, 18, 19, 20, 21, 22, 24, 25. Nevada, 1, 17, 20, 21, 24, 30. New Hampshire, 9. New Jersey, 23, 25, 26. New Mexico, 8, 12, 13, 14, 18, 19, 26, 27. New York, 4, 6, 9, 24, 28. North Carolina, 2, 4, 5, 6, 7, 11, 13, 21, 25. North Dakota, 9, 17, 18, 19, 20, 24. Ohio, 2, 4, 5, 6, 10, 11, 13, 20, 21, 22, 24, 25, 26. Oklahoma, 1, 18, 20, 21, 22, 25. Oregon, 1, 2, 10, 13, 16, 17, 18, 19, 27, 29. Pennsylvania, 2, 10, 23, 25. South Carolina, 3, 4, 14, 25. South Dakota, 1, 2, 3, 9, 17, 19, 23, 24, 31. Tennessee, 1, 3, 5, 12, 13, 14, 24, 26, 30. Texas, 1, 4, 6, 15, 16, 17, 18, 19, 22, 24, 27, 28, 30. Utah, 11, 12, 17, 18, 19, 20, 21. Virginia, 5, 6, 7, 8, 13, 19, 20, 22, 25. Washington, 1, 10, 12, 15, 16, 17, 18, 28, 29, 30. West Virginia, 2, 3, 5, 10, 13, 14, 19, 24, 25, 26. Wisconsin, 1, 2, 9, 10, 18, 20, 21, 24, 25. Wyoming, 1, 5, 8, 13, 15, 17, 28, 29, 30.

SLEET.

The following are the dates on which sleet fell in the respective States:

Colorado, 18, 31. Idaho, 17, 18. Maryland, 25, 28. Michigan, 5, 10, 25, 26. Minnesota, 1, 9. New Hampshire, 9. New Mexico, 12, 18, 19, 26. New York, 9, 28, 29. North Dakota, 9. Ohio, 10, 11. South Dakota, 9. Utah, 2, 4, 17, 18, 19, 20. Washington, 29. Wisconsin, 9, 10. Wyoming, 17.

HUMIDITY.

The average by districts appear in the subjoined table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	72	− 6	Missouri Valley	69	+ 4
Middle Atlantic	69	− 2	Northern Slope	65	+ 8
South Atlantic	74	0	Middle Slope	68	+ 8
Florida Peninsula	73	− 4	Southern Slope	65	+ 7
East Gulf	72	0	Southern Plateau	31	+ 1
West Gulf	77	+ 4	Middle Plateau	42	− 3
Ohio Valley and Tennessee	68	0	Northern Plateau	61	+ 3
Lower Lake	70	0	North Pacific	76	− 2
Upper Lake	73	+ 1	Middle Pacific	71	− 1
North Dakota	74	+10	South Pacific	68	0
Upper Mississippi Valley	72	+ 5			

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the table below:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.4	— 0.1	Missouri Valley	5.2	— 0.2
Middle Atlantic	5.1	— 0.1	Northern Slope	5.2	— 0.2
South Atlantic	3.9	— 0.5	Middle Slope	5.4	+ 0.6
Florida Peninsula	4.3	— 0.2	Southern Slope	4.6	+ 0.1
East Gulf	4.7	+ 0.4	Southern Plateau	2.6	+ 0.4
West Gulf	5.2	+ 0.3	Middle Plateau	4.2	+ 0.1
Ohio Valley and Tennessee	4.8	— 0.3	Northern Plateau	6.3	+ 0.7
Lower Lake	4.9	— 0.3	North Pacific	7.2	+ 1.3
Upper Lake	5.9	+ 0.4	Middle Pacific	4.3	+ 0.1
North Dakota	5.0	— 0.3	South Pacific	3.6	— 0.6
Upper Mississippi Valley	5.5	+ 0.3			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IV, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 6,425 thunderstorms were received during the current month as against 2,479 in 1901 and 2,404 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country was most numerous were: 24th, 478; 25th, 412; 23d, 368.

Reports were most numerous from: Illinois, 428; Missouri, 426; Ohio, 372; Iowa, 370.

A remarkable number of thunderstorms occurred in May, 1902, as shown by the following numbers recorded for each May during the period 1894 to 1902: 1894, number of thunderstorms reported, 3,657; 1895, 2,969; 1896, 4,795; 1897, 3,001; 1898, 4,545; 1899, 5,305; 1900, 3,855; 1901, 2,479; 1902, 6,425.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz: 18th to 26th.

In Canada: Thunderstorms were reported as follows: St. John, New Brunswick, 23; Halifax, 24; Grand Manan, 8, 25; Yarmouth, 7; Quebec, 23; Montreal, 22, 23; Bissett, 22, 25, 26; Ottawa, 1, 9, 23, 24, 26; Kingston, 7, 23, 24; Toronto, 9, 22; White River, 19, 22, 23; Port Stanley, 2, 4, 6, 7, 19, 20, 22, 23, 25, 26; Parry Sound, 6, 8, 20, 24, 25; Port Arthur, 29; Winnipeg, 18; Minnedosa, 7, 18, 19, 20, 21; Qu'Appelle, 6, 17, 18, 20, 29; Medicine Hat, 10, 15, 29; Swift Current, 19, 23, 30; Banff, 15; Battleford, 5, 28; Kamloops, 13; New Westminster, 27; Barkerville, 9, 10, 22, 27.

Auroras were reported as follows: White River, 29; Minnedosa, 9, 30.

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	17	53	w.	Mount Tamalpais, Cal	17	75	nw.
Do	21	56	sw.	Do	18	69	nw.
Bismarck, N. Dak	19	50	se.	Do	19	69	nw.
Buffalo, N. Y	8	50	sw.	Do	26	62	nw.
Do	22	50	w.	Do	28	56	nw.
Chicago, Ill	10	53	se.	Do	29	76	nw.
Do	25	54	ne.	Do	30	60	nw.
Cleveland, Ohio	4	58	w.	Do	31	52	nw.
Do	19	50	n.	New York, N. Y	9	64	nw.
Do	22	50	w.	Point Reyes Light, Cal	2	55	nw.
Denver, Colo	1	68	nw.	Do	16	76	nw.
Dodge, Kans	17	53	se.	Do	17	90	nw.
El Paso, Tex	18	50	sw.	Do	18	110	nw.
Fort Smith, Ark	18	50	sw.	Do	19	75	nw.
Huron, S. Dak	1	51	se.	Do	20	57	nw.
Minneapolis, Minn	1	50	se.	Do	29	66	nw.
Moorhead, Minn	1	52	se.	Do	30	65	nw.
Mount Tamalpais, Cal	7	50	nw.	Do	31	62	nw.
Do	8	59	nw.	St. Louis, Mo	4	52	sw.
Do	11	50	nw.	San Antonio, Tex	18	65	w.
Do	16	86	nw.	Sioux City, Iowa	20	50	s.

DESCRIPTION OF TABLES AND CHARTS.

By W. B. STOCKMAN, Forecast Official, in charge of Divison of Records and Meteorological Data.

For description of tables and charts see page 570 of REVIEW for December, 1901.